3D PRINTING SYSTEMS

Unleash your creativity

UP Plus 3D Printer Manual

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1. Introduction

1.1 How to use this manual

This User Manual is divided into four sections which cover the Introduction, Overview, Operation, and Troubleshooting. Please study this manual carefully before installation, and use the printer according to these instructions. Keep this manual handy and refer to it when necessary.

1.2 Precautions

Please read this section carefully before using the printer.

1.2.1 Safety

The printer can only be used with the power adapters supplied by this company, or the product may be damaged, with a risk of fire.
To avoid burning, or model deformation, do not touch the model, nozzle, or the platform by hand, or any other part of the body, while the printer is working or immediately after it has finished printing.
Protective glasses should always be worn when removing support material, especially PLA.
The brown sections of the currently supplied gloves melt at around 200 degrees, therefore please do not hold the extruder block with the gloves.
There is a slight smell from ABS when it is being extruded. The smell is, however, not too unpleasant. Operate in a well ventilated room but draught free. Draughts can affect warping of ABS prints. When ABS is burnt is releases toxic fumes.
Do not use ABS plastic or its printed parts near any kind of heat source, flames, fireworks, candles, incense, light bulbs, rockets etc. ABS will catch fire and burn a thick black smoke.
Always have adult supervision when children are present. Please keep all small printed parts away from young children, choking hazards! There are several safety issues, small tools, sharp tools and HOT objects and most parts used in connection with the 3D Printer. Tie back long hair and loose clothing. Keep fingers away from moving parts.
Tools and parts should be stored at a suitable height away from small children.
Tools should be used in conjunction with safety gloves and glasses.

1.2.2 The following classifications are used in this manual.

	CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	WARNING: Indicates a potentially hazardous situation which, if not avoided, may result in serious injury.
	Gloves: When performing certain maintenance procedures, the machine may be hot and gloves are required to avoid burns.
	Safety Glasses: Wear safety glasses to avoid injury to your eyes.

1.2.3 Protection

The printer must not be exposed to water or rain, or damage may occur.
Do not shut down the UP System or pull out the USB cable when loading a digital model, or the model data may be lost.
When using the “Extrude” function, keep at least 50mm between the nozzle and the platform. If too close, the nozzle may get blocked.
The printer is designed to work properly at an ambient temperature of between 15°C and 30°C and humidity of between 20% and 50%; Operating outside these limits may result in low quality models.

1.2.4 3D Printer burn in test

Before shipping your printer has undergone a thorough test. You will notice in the maintenance screen that it reports several KG’s of usage, this is normal and from testing prior to leaving the factory.

1.2.5 Status Indicators

LED State		Indicates
	Solid Red	Printer is not intilised
	Solid Green	Printer is ready

	Flashing 10 times per second	Computer is sending / spooling job to the printer.
	Flashing 5 times per second	Extruder is heating
	Flashing 2 times per second	Printing in progress
	Flashing about every 2 seconds	Printing has stopped.

2. Overview

The UP Plus 3D Printer is designed with ultimate portability and simplicity in mind. The system and software allow you to print great models with only a few keystrokes, even if you have never used a 3D printer before. The system uses a nozzle to deposit molten plastic, so printed parts are strong and durable. Congratulations on purchasing you're UP Plus 3D Printer.

2.1 Appearance

Figure 1. Front view of printer

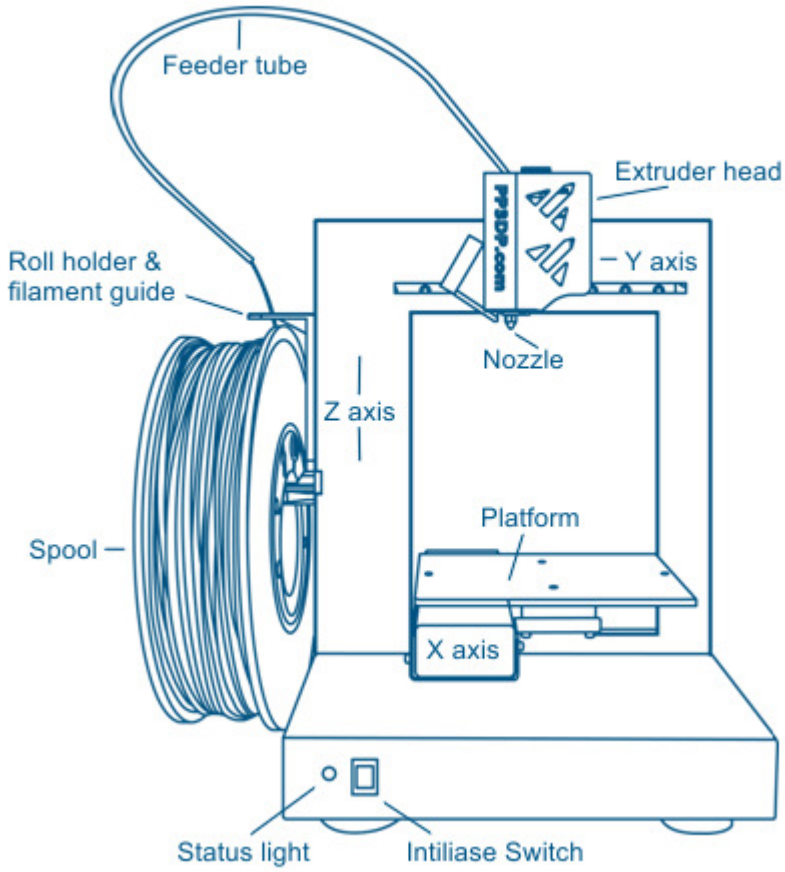


Figure 2. Back view of printer

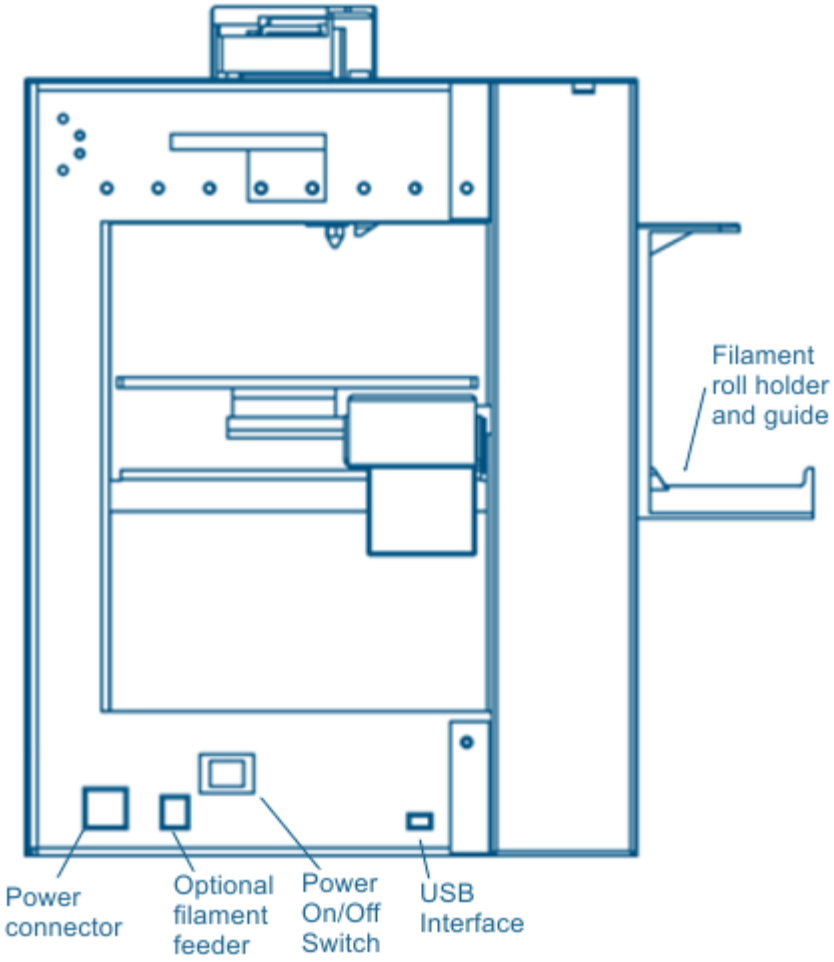
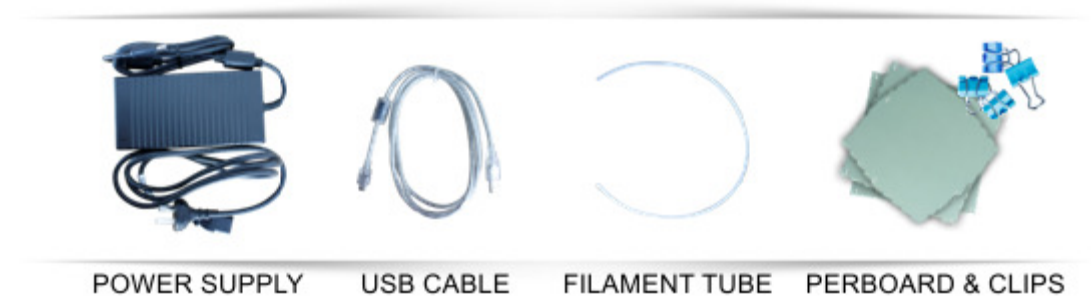


Figure 3. Accessories

PARTS



TOOLS

Bag of spare screws and washers.

2.2 Specifications

2.2.1 Printer Physical Characteristics

Printing Material	ABS or PLA
Material Color	White
Layer Thickness	0.15－0.40mm
Print Speed	(fine) 10－ (fast) 100 cm^3/h
Print Bed Size	140×140×135mm
Printer Weight	5 KG (11 lb)
Printer Size	245 × 260 × 350 mm
Extrusion Temperature	ABS: 260-270c PLA:200
Platform Temperature	ABS: 100c PLA:50c

2.2.2 Specifications

Power Requirements	100-240VAC, 50-60Hz, 200W Input: 19VDC 9.5amp Output (optional feeder) 12VDC 1amp
Model Support	Smart auto-generated and easy to break away support material.
Input Format	STL
Workstation compatibility	Windows XP/Vista/7 & Mac

2.2.3 Environmental specifications

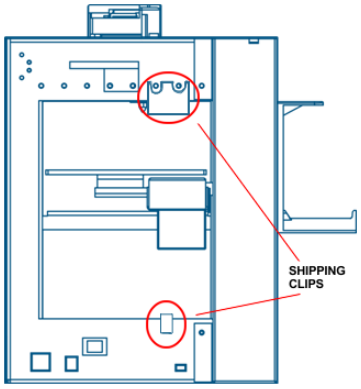
Ambient temperature	15°C～30°C
Relative humidity	20%～50%

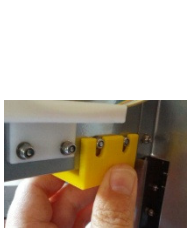
3. Operation

3.1 Preparation

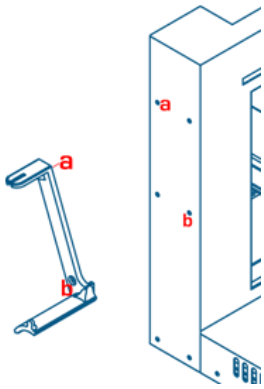
3.1.1 Quick Setup

1. Remove the two packing clips that hold the extruder head and platform in place during shipping.



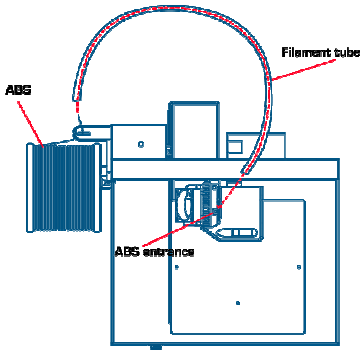
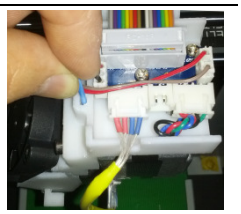
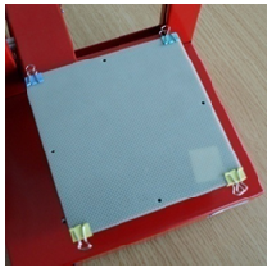
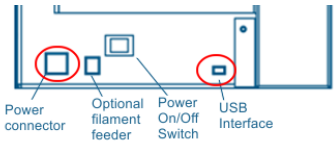
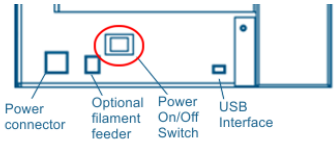


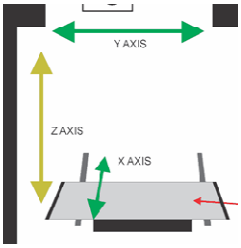
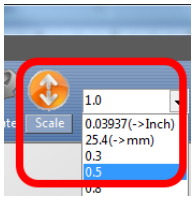
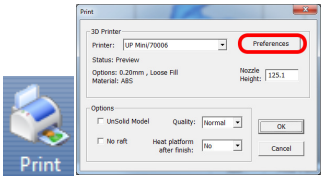
2. Attach the “roll holder / feeder guide” onto the left side of the printer using the middle sized included alan key. Remove screw (b) and attach the roll holder as per diagram and attach with screw (b)



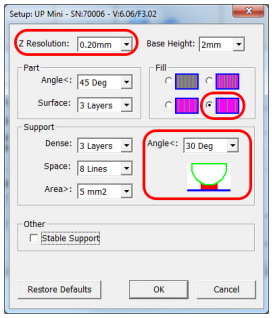
3. Open the foil bag that contains the ABS filament.

NOTE: Do not let go of the end of the filament, otherwise it will unravel itself and tie itself in a knot, which will then cause a block in the extruder head and several hours of unwinding the spool manually to find the knot!

4. Load the spool of filament onto the roll holder, with the filament coming out from the back of the roll / printer.	
5. Feed the end of the filament through the filament guide. Feed the filament through the feeder tube and feed about 10cm out the other end of the tube.	 *Top View*
6. Push the end of the filament into the print head feed hole.	
7. Place the Perfboard on top of the black platform and attach the binder clips on the front in order to hold the Perfboard in place. Always remove the Perfboard after printing to remove printed models from the printer. When printing starts, melted plastic will be pushed into the holes of the Perfboard.	
8. Plug the USB cable into the back right of the printer.	
9. Plug in the power adapter and USB into the back of the printer.	
10. Switch on at the wall socket and switch on at the back of the printer.	
11. Visit www.3dprintingsystems.com/support to download and install the 3D Print Software.	Chapter 3.1.2 Installing the software
12. Installing the drivers (Windows)	Chapter 3.1.3 Installing drivers (Windows)

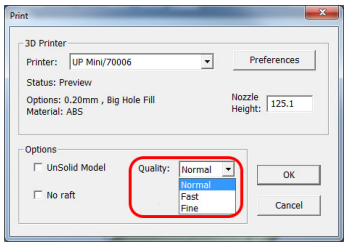
13. Open the software, then click “3D Print” and then “Initialise”. The printer should align each of its 3 axis. X axis – the table forward and backwards, Z axis – table up & down, Y axis – head moves left and right and then beeps.	 Chapter 3.3.1 Initialising the Printer
14. Before you can print, you need to set the height between the nozzle and the platform.	Chapter 3.3.2 Setting the Platform Height
15. Let the printer know you have added a new spool of material. Click “3D Print” / “Maintenance” / “New Spool”	Chapter 3.3.4 Other Maintenance Options – New Spool
16. Load the filament into the extruder head, click “3D Print” / “Maintenance” / “Extrude”	
17. Download the test “Bunny.STL” file located under “My first print”	http://3dprintingsystems.com/support/
18. Run the software and then click “Open”. Locate where you downloaded the “bunny.stl” file and open it.	 Chapter 3.2.2 Loading a 3D model
19. Scale the bunny by 50%, click “Scale” and select “0.5”.	 Chapter 3.2.4 Model Transformations
20. Click “Place” this will centre the model or models on the base of the print area on the software.	
21. Click the “Print” icon and click “Preferences”	

22. Select the following:
    Z Resolution: "0.2mm"
    Fill: Hollow Honeycomb (bottom right)
    Support Angle: 30 degrees
    Typically these are the only values you'll need to change.
    Click "OK"

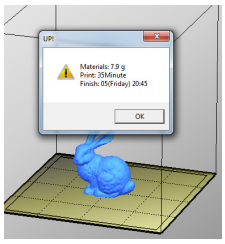


Chapter 3.3.6 Print Preferences

23. Select the overall print quality
    Normal = Average quality
    Fine = Good quality and takes longer
    Fast = Draft quality and takes less time
    Now click "OK" to start your first print!



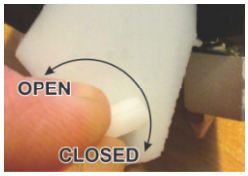
24. The software will now spool the print job to printer. Once finished spooling, the printer will **beep**, you can then disconnect the USB cable from your computer if you wish.



Chapter 4. Printing

25. The printer will now start to preheat the platform and the extruder. You can watch the temperature raise by clicking "3D Print" and "Maintenance"

26. Make sure the extruder vent door is closed (turn lever to the right). This is located on the left side of the extruder print head. Having the door closed with speed up pre-heating time on both the extruder head and the heated platform.



Chapter 4.1 Extruder Vent

27. Once the printer has finished printing remove the part and break away the support material.

3.1.2 Installing software

Visit www.3DPrintingSystems.com/support to download the latest software for MAC and Windows and install the software.
Windows: Start the UPx.xx setup.exe file and install it to the specified directory (Default is "Program files/UP" or for 64bit computers Program files x86\UP"). Note: This installs the UP software, the UP drivers, and the UP sample files into your Program files/UP folder.

3.1.3 Installing drivers

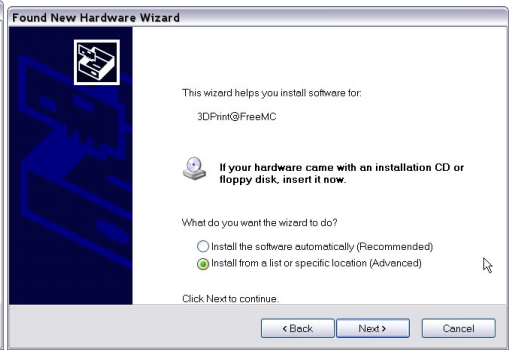
Required for Windows only, MAC doesn't require drivers.
Connect the printer to a computer with the USB cable. The computer should pop up the "Found New Hardware Wizard" window. Choose "No, not this time", and then "next". Then choose "Install from a list or specific location (Advanced)", then "Next".

Here is a video on the driver installation for Windows http://www.youtube.com/watch?v=hGYTCRYkJr4

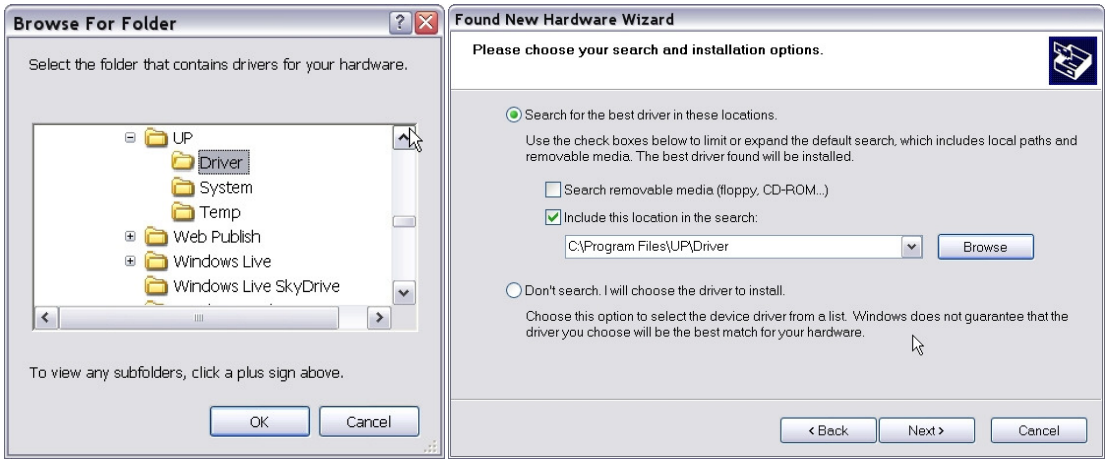
Windows 8
To install the Windows 8 drivers for your UP Plus, or UP Mini 3D printer you will need to do the following;

Open the Windows 8 control panel
Select General
Advanced Startup
Restart now
On reboot pop up menu will appear
Select "Troubleshoot"
On the next menu select Advanced Options
Startup settings
Restart
Disable Driver signature Enforcement
Done
Now you should be able to install the drivers without any issue.

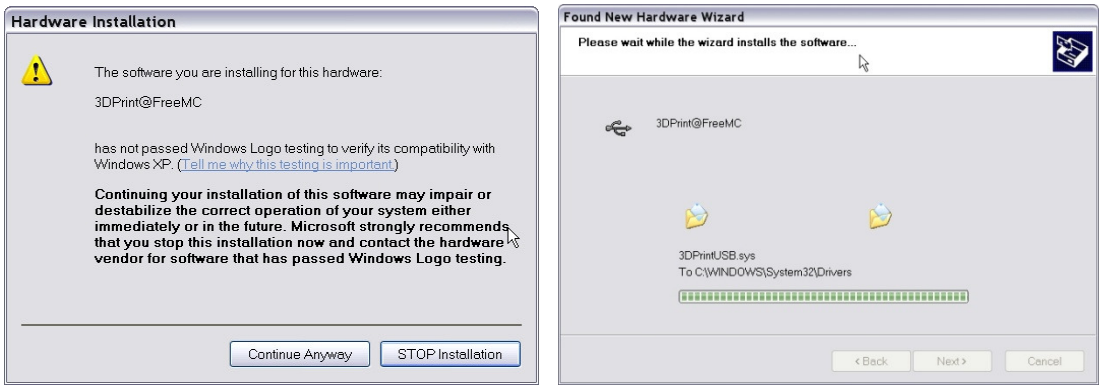
Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel


Found New Hardware Wizard
This wizard helps you install software for:
3DPrint@FreeMC
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

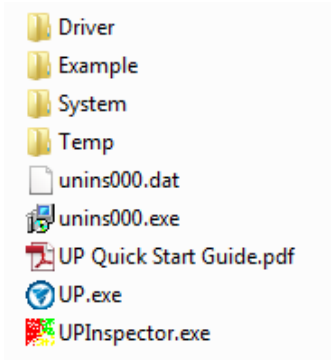
Click "Browse", and choose C:\Program Files\UP\Driver, then "Next".


Browse For Folder
Select the folder that contains drivers for your hardware.
UP
Driver
System
Temp
Web Publish
Windows Live
Windows Live SkyDrive
To view any subfolders, click a plus sign above.
OK
Cancel
Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
C:\Program Files\UP\Driver
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

The following dialogue box pops up. Choose “Continue Anyway”, and the drivers will install automatically.


Hardware Installation
The software you are installing for this hardware:
3DPrint@FreeMC
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation
Found New Hardware Wizard
Please wait while the wizard installs the software...
3DPrint@FreeMC
3DPrintUSB.sys
To C:\WINDOWS\System32\Drivers
< Back
Next >
Cancel

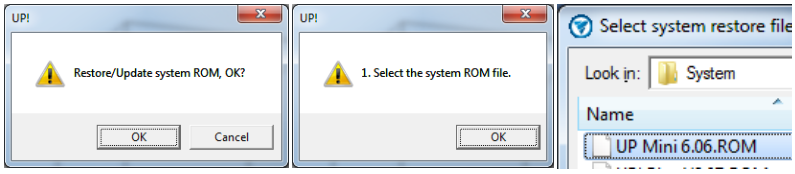
If you have any problems installing the drivers, or get a "Winusb.dll not found" error, please refer to the driver section in the troubleshooting section of this manual. Sometimes “3DPrint@FreeMC” is referred as “Free Motion” depending on your model number. Here is a video on the driver installation http://www.youtube.com/watch?v=hGYTCRYkJr4

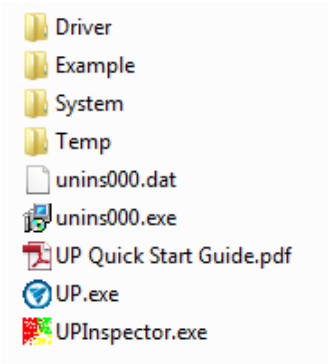


3.1.4 Updating your ROM

Even if your printer is brand new, it is best to check you have the latest ROM version number installed on your printer. Currently the ROM update can only be updated using the Windows software. If you have a MAC it's best to get access to a Windows PC to just do the ROM update.
In the UP software click "Help" and "About UP".

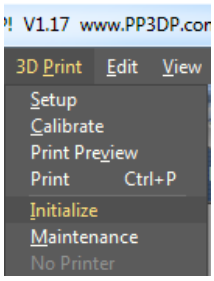
1. Compare "Rom: Vx.xx" in the about page to the file located in to "C:\Program files (x86) \UP\System" "UP Plus x.xx.ROM"
2. If your ROM version on the "About" page is lower, then follow 3.) otherwise your UP Plus is up to date!
3. Click "Tools" "Update ROM" and select the relevant ROM file for your printer and follow the on screen instructions.



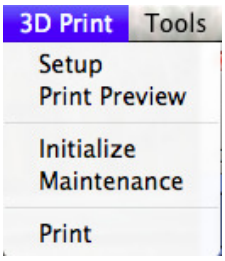


3.1.5 Initialising the Printer

Before anything can be printed, the printer must be initialised. Click the “Initialise” option under the “3D print” menu. The printer will beep and the initialisation procedure will begin. The printer will then return the platform and print head to the printer’s origin and beep again when it is ready.



(Windows version)



(Mac version)

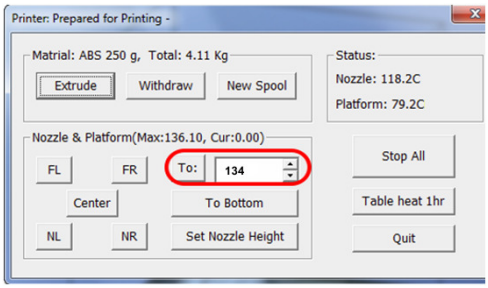
TIP: If your printer is not responding properly, the first thing to try is to re-initialise the printer by clicking the ‘Initialise’ option from the ‘3D Print’ menu. If still not working switch off and on the printer at the back. Check the printer driver’s trouble shooting section. The printer can also be initialised by pressing the front switch on the printer.

3.1.6 Setting the Platform Height

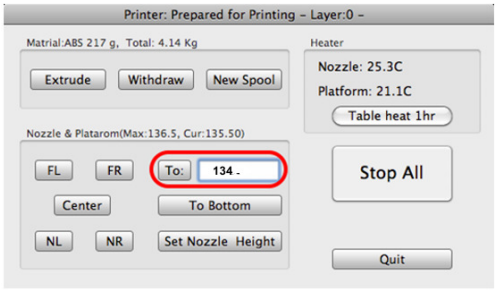
This section is probably the most important of the entire manual and only needs to be done seldom. Please read it carefully to ensure that you understand the platform height setup procedure, as it is vital for successful 3D printing.
To print successfully, the platform should be set to start at a distance of 0.2mm (A piece of paper folded over) from the nozzle. As each printer is slightly different, this distance needs to be calibrated before starting to print.

To work out the correct nozzle distance, please follow these steps:

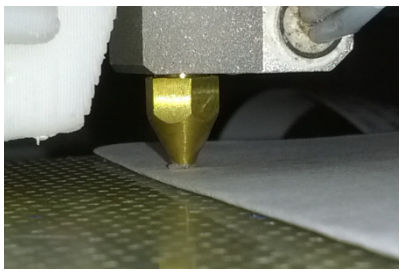
Click "3D Print" and click "Maintenance", the below dialogue box will open.

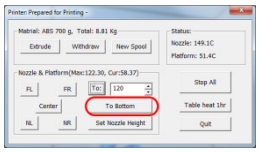


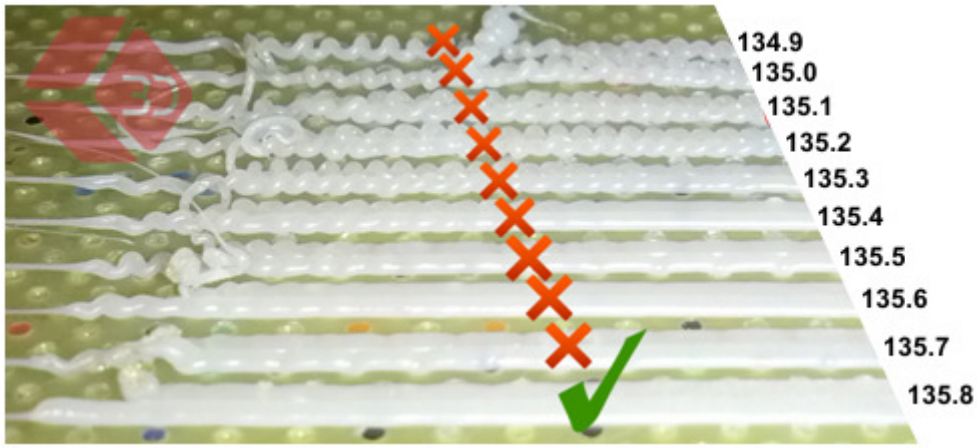
Windows version



MAC version

In the text box, type in the height to which you want the platform to move to, and click the "To" button. In the above example, the platform will move to 134mm. The UP Plus has a print height of 135 to 138mm.	*Note: You do not want to crash the platform into the nozzle, so increase the height in smaller and smaller increments as you get closer to the nozzle. If you do crash the platform into the nozzle, it is best to initialise again.*
Check the distance between the nozzle and the platform. If, for example, the platform appears to be about 2mm away from the nozzle, increase the number by 1mm and click the "To" button. As the platform gets closer to the nozzle start increasing the number in the text box by 0.2mm increments and click the "To" button. Repeat this until you get to within 0.2mm of the nozzle. TIP: An easy way to check the distance between the nozzle and platform is to fold a piece of paper in two (Which will make it about 0.2mm thick) and use that as a spacer to gauge the distance between the nozzle and platform.	 ***TIP:*** *If you find you get lifting at a later stage, increase the platform height.*
1.) Now click "Set to Nozzle Height".	

1.) Now click “Goto Bottom” in the Maintenance screen.	



Above values are only an example and will be different on your printer.

NOTE: Once you have setup the nozzle height once, you should do not need to do it again as it is now saved in the printer.

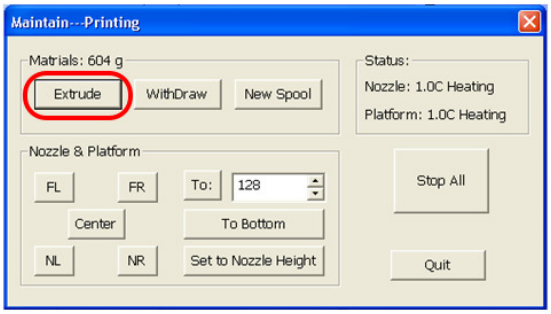
TIP: You may need to regularly recalibrate nozzle height after moving the printer, or if you find the models are not adhering to the platform properly, or are warping.
TIP: If you happen to crash the platform into the nozzle while setting the height adjustment, always re-initialise the printer before undertaking any further operations and start again. You do not need to intialise the printer after every print. Normally only when switching on the printer.

NOTE: It is only possible to move the nozzle to 8mm higher than the height recorded in the “Print” screen. If, for example, the nozzle height in the “Print” screen is set to 110mm, you will only be able to move the nozzle up to 118mm in the “Maintenance” screen. This maximum value is indicated by the “Max” value shown in the platform and nozzle line of the “Maintain” screen. This is a safety measurement to avoid crashing the table into the nozzle and causing extensive damage.
If you are having problems adjusting the nozzle height in the “Maintenance “ screen because it will not go high enough, close the “Maintenance” screen, open the “Print” screen, and set the nozzle height to 122mm (for example). Then go back to the “Maintenance” screen and continue with your nozzle height adjustments.

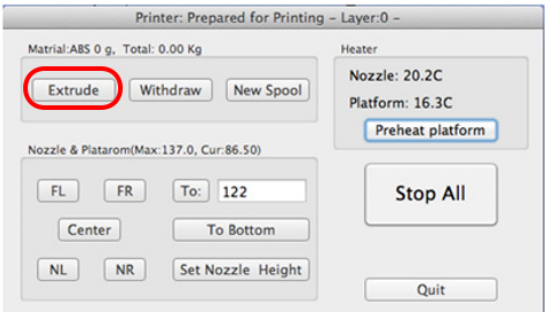
3.1.7 Loading the filament into the Extruder Head

Click on the menu “3DPrint” -> “Maintenance” -> “Extrude”. The printer extruder will now start to heat. (*Takes approximately 10mins)*
After the printer nozzle has warmed up to 260°C, the printer will beep. Push the filament into the

hole at the top of the extruder head and push the filament in with some gentle pressure until the extruder motor grabs it and starts pulling it through the extrusion head. The extruder will then automatically extrude a thin filament of material. After the printer beeps a second time (meaning the extrusion process is complete), pull away the piece of extruded plastic.



(Windows version)

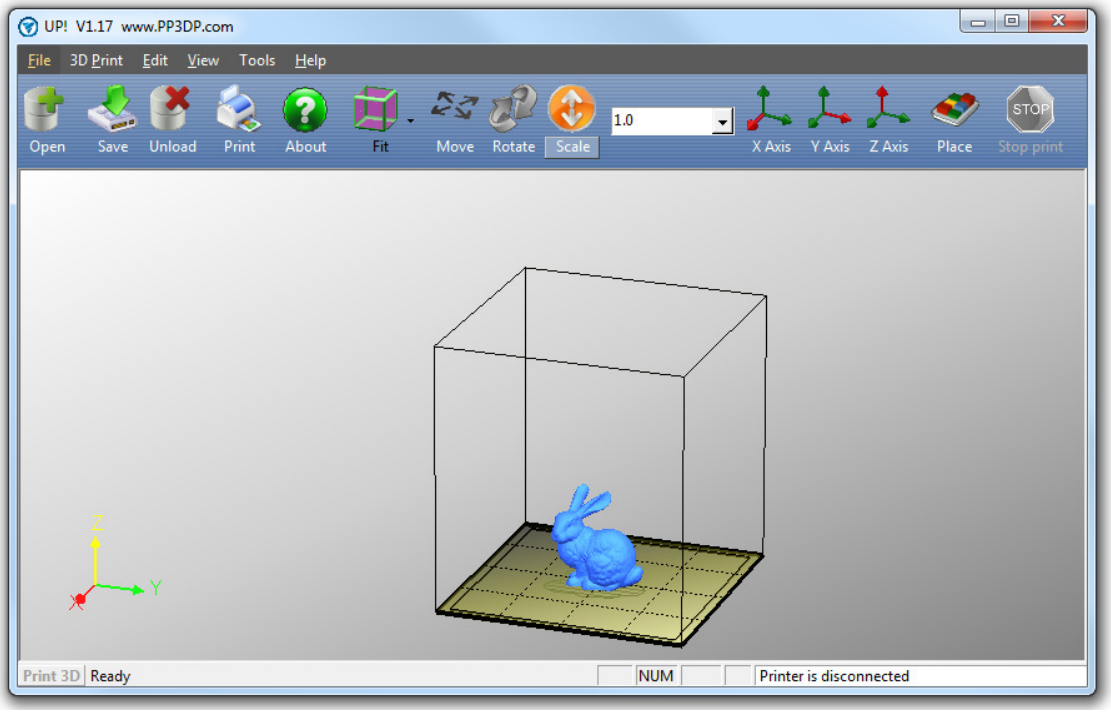


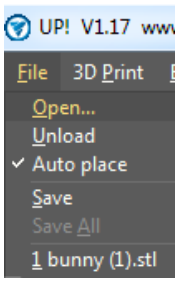
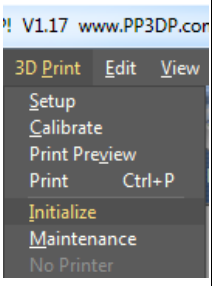
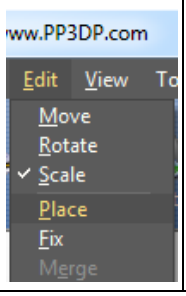
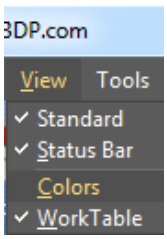
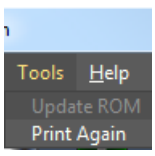
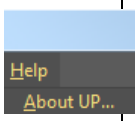
(Mac version)

3.2 Using the basic functions

3.2.1 Start the program

Click on the UP icon on the desktop.


UP! V1.17 www.PP3DP.com
File 3D Print Edit View Tools Help
Open Save Unload Print About Fit Move Rotate Scale 1.0 X Axis Y Axis Z Axis Place STOP Stop print
Print 3D Ready
NUM
Printer is disconnected

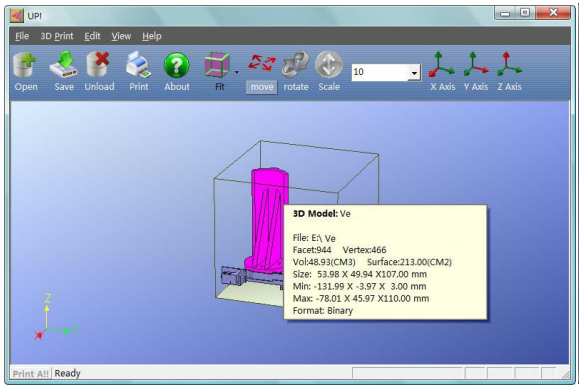
FILE	3D Print	Edit	View	Tools	Help
					

3.2.2 Loading a 3D model

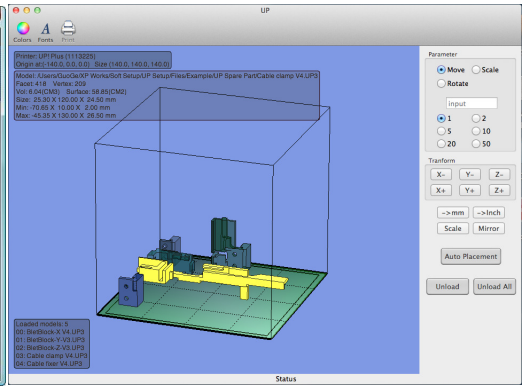
Click “File / Open” or on the toolbar and select the model you want to open. UP Software only supports STL files (which is the standard input format for 3D printing files), and the UP3 file format (which is UP’s proprietary compressed STL format)

TIP: There are thousands of free 3D printable models available at www.thingiverse.com

Move the mouse pointer onto the model, and click the left mouse key. Some model information is presented in a floating window, as shown below:


UP!
File 3D Print Edit View Help
Open Save Unload Print About Fit move rotate Scale
X Axis Y Axis Z Axis
3D Model: Ve
File: E:\ Ve
Facet:944 Vertex:466
Vol:48.93(CM3) Surface:213.00(CM2)
Size: 53.98 X 49.94 X107.00 mm
Min: -131.99 X -3.97 X 3.00 mm
Max: -78.01 X 45.97 X110.00 mm
Format: Binary
Print All Ready

(Windows version)



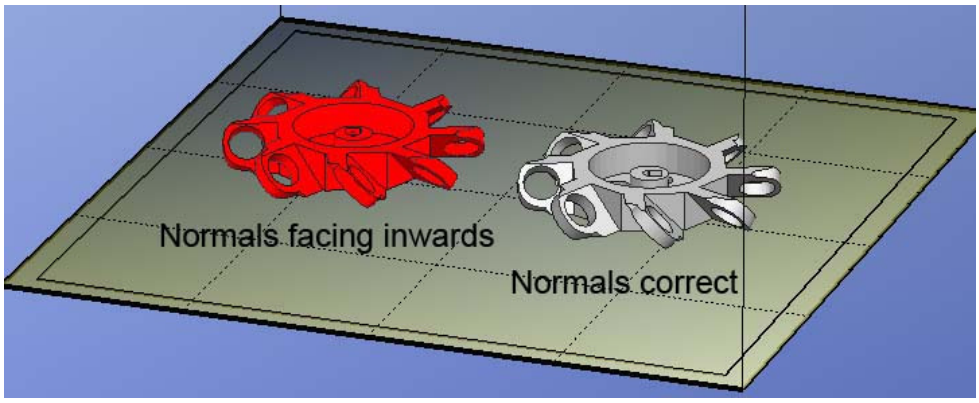
(Mac version)

TIP: You can open several models and print them all at the same time. Just repeat the open model procedure for each model you want to add. See the "Placing models on the build platform" section for more information.

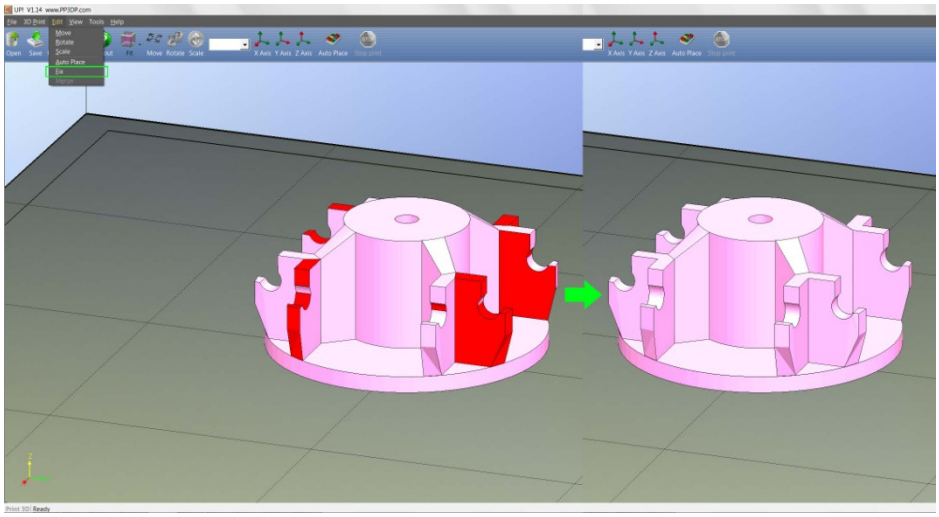
Unloading the model: click the left mouse button on the model to select it (Pink), and click "Unload" on the toolbar or click the right mouse button while over the model and a context menu will appear. Choose unload the model or unload all models (if you have more than one file open and want to remove all of them).

Saving the model: Choose the model, then click "Save". The file is saved in UP3 format and its size is 12%~18% of the original STL file. This is a convenient format for users to archive or transfer files.

Note on STL files: For a model to print correctly, all the faces of the models need to have their normal facing outwards. The UP software uses colour Red to indicate a problem with a model. The default colour used by the software when opening a model is a light grey/pink colour. If the normals are facing the wrong way, then the model is coloured in red. Try fixing it with the Fix tool or saving it as an UP3 file and reopening it.



Fixing STL Files: If you load a model and parts of it are highlighted in red, then the model has some errors. The Up software has an option that attempts to fix models with bad surfaces. Under the "Edit" menu you will see a "Fix" option. Select the model with inverted surfaces, and click the "Fix" option to try and fix it. Also saving the model as a UP3 file, then reopening the file can also fix it. If you still cannot fix, just try printing a rough version to see if it comes out. If you still have errors use the option in the print screen called "UnSolid Model" and just print it.



Merging models: Several separate models can be merged into a single file by using the "Merge" option from the "Edit" menu. Simply open all the models you want to merge and arrange them the way you want on the platform and click on the "Merge" option. When you then save the file, all the components will be saved as a single STL file.

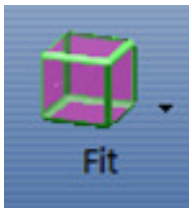
3.2.3 View Options

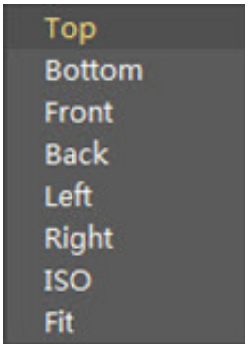
To observe the target model in different ways, use the mouse to control the view.
Rotate: Press the middle mouse button and move the mouse: The view can be rotated and observed from different angles.

Pan: Press Ctrl and the middle mouse button at the same time and move the mouse: This causes the view to pan. You can also use the arrow keys to pan the view.

Scale: Rotate the mouse wheel: The view gets zoomed in or out.

View: The system has 8 preset standard views stored under the “View” button on the toolbar. Click the View button on the toolbar (the startup value for the View button is “Fit") to find these options:



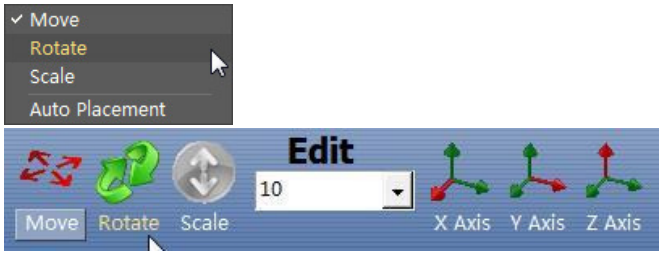


(Windows version)

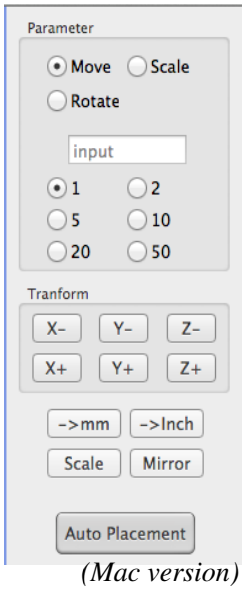
(Mac version)

3.2.4 Model transformations

Model Transformation can be achieved through the Edit menu or the toolbar:



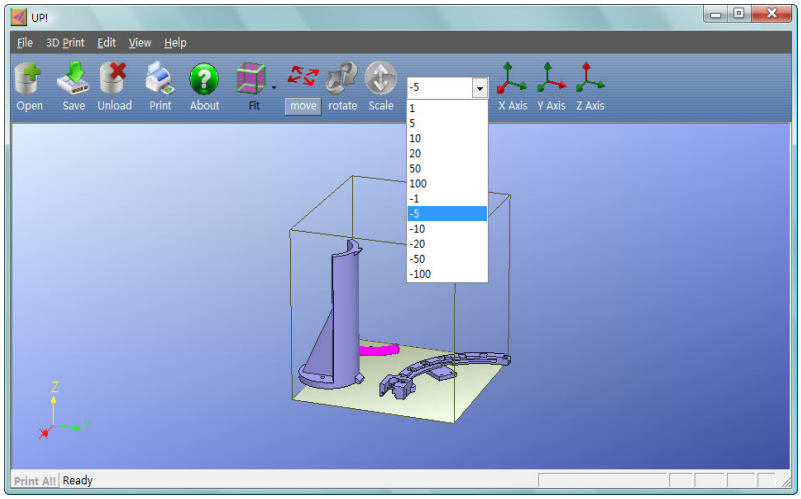
(Windows version)



(Mac version)

Moving the model: Click the "Move" button and choose, or input, the distance you want to move in the text box. Then choose the axis (direction) in which you want to move. Each time you click the axis button the model will move again.

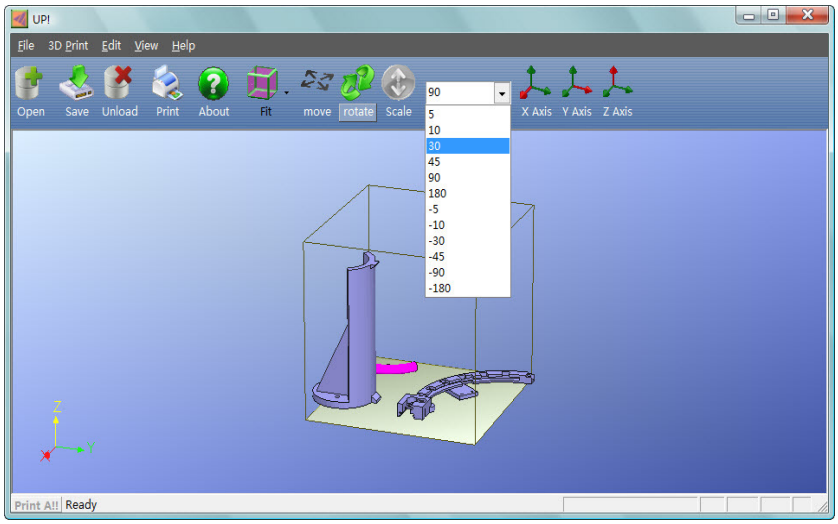
For example: Move the model -5mm along Z axis (or down 5mm).
Procedure: 1. Click on "Move"; 2. Input "-5" in the text box;
3. Click the "Z axis".



Tip: If you hold down the 'Ctrl' key, you can simply drag the model to whatever position you want.

Rotating the model: Click the "Rotate" button on the toolbar, choose or input how many degrees you want to rotate in the text box, then choose the axis to rotate around.

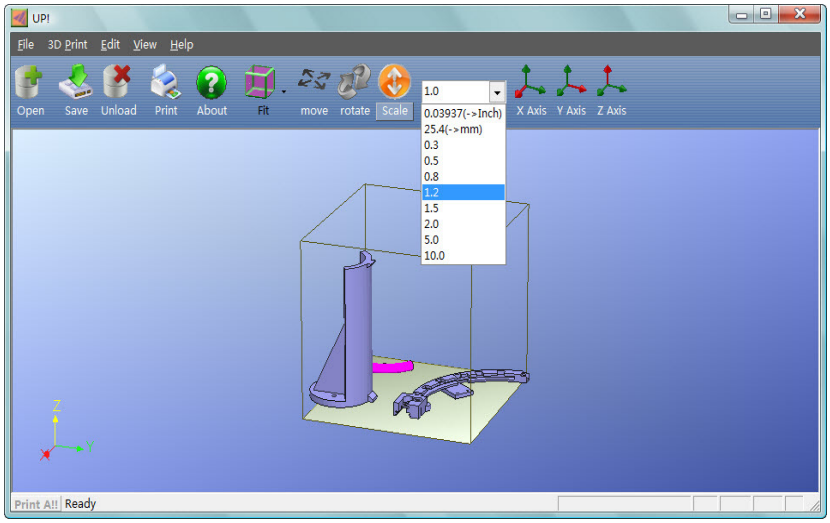
For example: Rotate the model around Y axis by 30°.
Procedure: 1. Click "Rotate"; 2. Input 30 in the text box； 3. Click "Y axis".
Note: positive numbers rotate counterclockwise and negative numbers rotate clockwise.



Scaling the model: Click “Scale”, choose or input a scaling factor in the text box, and then either scale the model uniformly by clicking the scale button again, or choose the axis around which you want to scale if you only want to scale in one direction.

Example1: Scale up the model uniformly by 2.0 times.
Procedures: 1. Click “Scale”; 2. Input 2.0 in the text box; 3. Click “Scale” again.

Example2: Scale up the model by 1.2 times along the Z axis only.
Procedures: 1. Click “Scale”; 2. Input 1.2 in the text box; 3. Click “Z axis”



Unit Conversion: This option is provided as a convenient way to convert metric models to imperial, and vice versa. To convert an imperial model to metric, select the 25.4 option from the scale menu and click “Scale” again. To convert from metric to imperial, select the 0.03937 option and click “Scale”.

3.2.5 Placing models onto the build platform

Appropriately placing your models on the platform can have an effect on print quality.

TIP: In general, try to place your model in the centre of the platform.

Place: Click the "Auto Place" button, on the far right of the toolbar, to automatically place the model on the platform. When there is more than one model on the platform, using "Auto Place" is recommended.

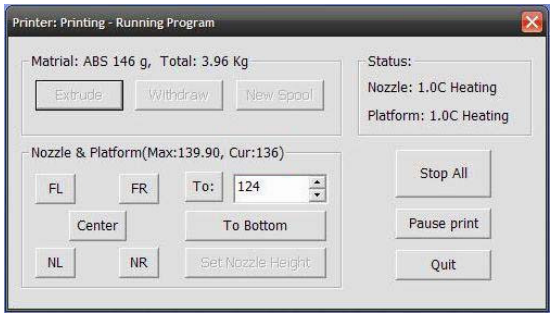
By Hand: Press the Ctrl key and choose the target model by pressing and holding the left mouse button. Move the mouse and drag the model to the desired position.

Using the "Move" button: Click the "Move" button on the toolbar, choose or input the distance in the text box, and then choose the axis for the direction in which you want to move.

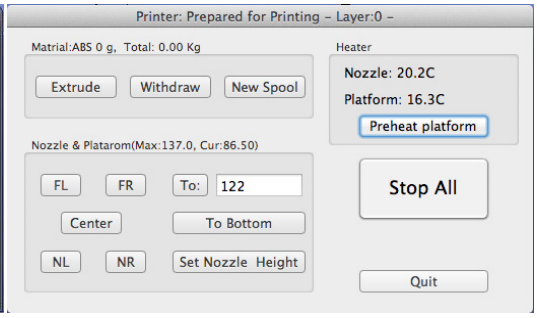
NOTE: When more than one model is loaded, the gap between each model should be kept to at least 12mm to prevent the models sticking together. If printing multiple models, you can move them closer and then merge the models together. Click "Edit" menu, click "Merge" which combines multiple separate models into one model, this can be saved as an UP3 file.

3.3.4 Other Maintenance Options

Click "Maintain" on the "3D Print" menu, and the following dialog box pops up:



(Windows version)



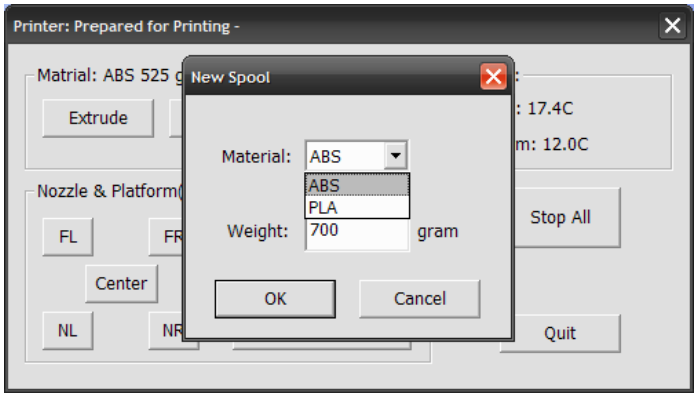
(Mac version)

Extrude: Squeezes material out of the nozzle. Click on this button, and the nozzle is heated. When the temperature is high enough (260°C), the material is squeezed out of the nozzle. When the system beeps, feed the filament into the hole *(it might need a small push for the filament to grab it)* then it will start extruding, it will beep again when finished. When changing the material (See section 6), this function is used to deliver the new material to the nozzle. This function can also be used to test whether the nozzle is working correctly.

Withdraw: Withdraws the material from the extrusion head. When the material runs out, or the nozzle needs to be changed, click this button. When the nozzle is up to temperature (260°C) and beeps, gently pull out the material. If the material gets stuck, pull it out it by hand.

New Spool: This is used so the printer can keep track of how much material has been used, and warn you if you don't have enough material left to print your model. Click this button and enter

the value of how many grams of material you have on the current spool. If it is a new spool, the quantity should be set to 700 grams. You can also specify whether the material you are printing with is ABS or PLA.



TIP: An empty spool weighs about 280 grams so, if you are installing a partially used spool, weigh it, and subtract 280 grams from the weight. This gives you the value to enter into the material text box.

Status: Displays the temperature of the nozzle and platform.

Stop All: Stops heating and all the movement of the printer. Once you click this button, the current model being printed is cancelled. You CANNOT resume a print job once the printer has been stopped. After you use the "Stop All" option, you will need to re-initialise the printer.

Pause Print: This button allows you to pause a print in mid-progress, you can then resume the print job where it left off. This is very useful if you, for example, want to change the material colour mid-print. Another popular use for pausing a job mid-print is to allow fasteners to be inserted into printed cavities and then printed over to lock the fastener into place. **Note:** This keeps the extruder and platform heating during the pause, it's not recommended to pause for long periods of time.

Nozzle & Platform: The five buttons (FL, FR, Center, NL, NR) control the position of the nozzle and the platform. The nozzle moves to the left and right; the platform moves forward and backward.

The "To" button controls the height of the platform, and is used in the nozzle height calibration procedure described in 3.3.2.

The "Bottom" button returns the platform to the lowest position.

Set Nozzle Height: Takes whatever value you have in the "To" box and transfers it to the Nozzle box of the setup screen.

3.3.5 Preparing the Platform

Before printing, the platform must be prepared so that the model adheres to the platform enough to be printed without the model moving. Use the clips in the box provided, these are used to clip the front of the Perfboard onto the platform. For large models the warping force can be so strong that it will cause the Perfboard to warp as well, in these cases you will need to use more clips to hold it down.

The Perfboard is cut at 45 degrees angle with the edge, and just fits the size of the platform. When printing starts, plastic will have more chance to be pushed into all perforations, and this provides a stronger mechanical bond with the bottom surface that prevents it from later lifting.

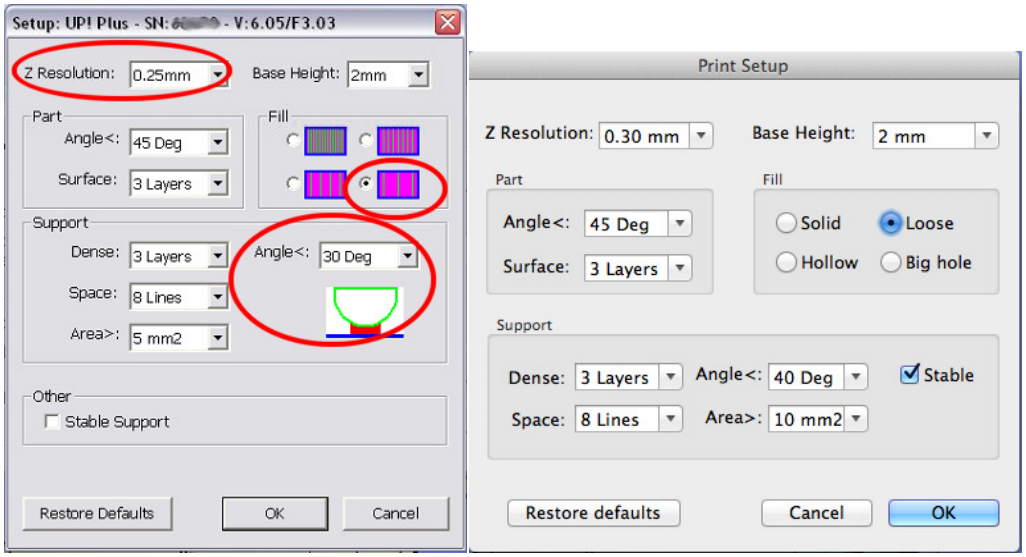
Cleaning the Perfboard

To clean the platform, use the included red Perfboard pokers. The preference is to use the spatula and simply just scrape off the surface plastic until smooth on both sides. If you preheat the table for longer the plastic left in the Perfboard holes becomes soft and the extruded plastic sticks to it, thus not requiring the holes of the Perfboard to be empty/clean.

3.3.6 Print Preferences

Click menu “3D Print->Setup” or Click “print” and select “Preferences’ and the following dialog box opens:

Recommended Settings in red and in most cases are the only values that require changing depending on the model you are printing.



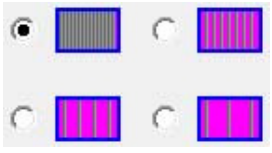
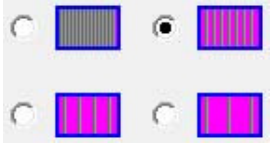
Windows version *Mac version*

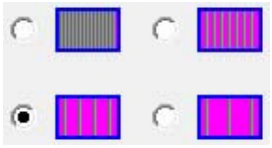
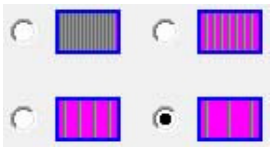
Z Resolution:

Sets the print resolution (layer thickness) of the printer. This can be between 0.2mm per layer to 0.4mm per layer. The finer the layer thickness, the better quality, the stronger the printed part and the longer it takes to print.

Fill:

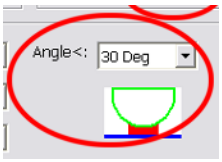
There are four types of honeycomb fill that the interior of parts are made of. These cut away images below show the four different internal fill types.

		**Solid Honeycomb:** The part is made of nearly solid plastic, which gives you the strongest part with a longer print time. This setting is recommended for strong and functional parts.
		**Semi-Solid Honeycomb**

		**Semi-Hollow Honeycomb**
		**Hollow Honeycomb:** The Part is made mostly hollow, which gives you the weakest part but faster print time. Parts with flat top surfaces can slightly droop with this setting.

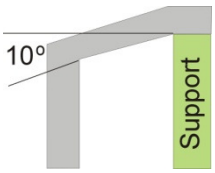
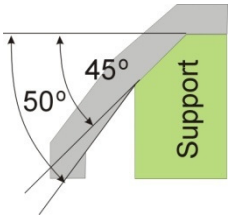
Support Options (Smart Support)

The software's Smart Support is where the software will automatically calculate where it requires support material. The Bunny on the left was printed with 80 degree support and then the support material is broken away to reveal the end result on the right. The recommended setting is 30 or 10 degrees.

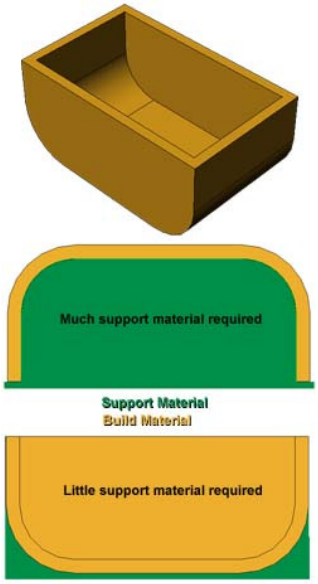


Support Angle: *(Recommended Angle:30)*

Angle at which support material gets inserted. For example if 10° is used, support material only gets used if angle of surface is greater than 10° from horizontal (so support material is almost not used unless there is a direct overhang), If set to 50° than support material is used for any surface that is greater than 50° away from horizontal. In the image on the left of a green curve, the red indicates the amount of support material, changing the angle higher will produce more support.

Set to > 10°	Set to > 50°
	

There is always a delicate balance between Plusmizing the amount of support material, versus the quality of the part, versus the difficulty of removing support material.

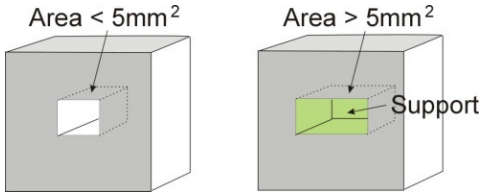


The orientation of the part on the print platform is also critical in deterPlusng both how much support material gets used, and also how difficult the support material will be to remove.

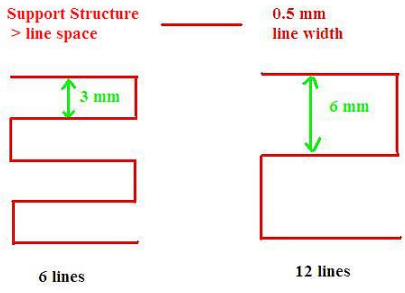
As a general rule, it is easier to remove support material from the outside of a part than from the inside. As can be seen in the picture to the right, the part would use a lot more support material if printed with the opening facing downwards than if it were facing upwards. However to achieve the

Support - Dense: This represents how many layers of 'solid' (dense) material form part of the support structure directly beneath the model. *Default = 3 layers*

Support - Space: The distance between the lines of non-solid support material. Changing this parameter requires some experience in balancing the quantity of support material used, ease of support material removal, and part print quality.

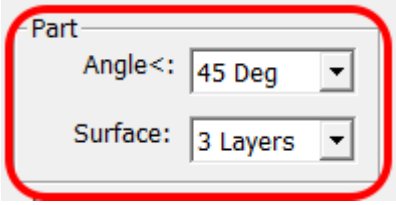


Support - Area: The surface area above which support material gets used. When you choose 5mm^2, for example, there will be no support if the overhanging area is less than 5mm^2.



Base Height:
This is the thickness of the raft of material before the support layer is printed under the part. When the printer starts printing, it first prints a raft of non-solid material in which all the lines of support material are horizontal (along the Y axis). It keeps building up horizontal rows of support material for as many mm as you have chosen. Then, just before it gets to the bottom surface of the real part, it starts to build support layers perpendicular to the raft layers layer. *The default value is 2mm.*

Part - Angle:
The part Angle determines at what point solid (dense) support material gets used. If the angle is small than the printer will add solid fill layers under the part surface. The thickness of this solid (dense) support is determined by the "dense" parameter under the Support options as described below.



Part - Surface:
This parameter determines how many layers form the bottom face of a part when it is not solid. For example, if you set it to 3, the machine will print 3 complete layers before going into non-solid mode. This does not, however, affect the side wall thickness on non-solid parts, which are all the same thickness (approximately 1.5mm) irrespective of the fill mode.

Stable Support: Stable support creates support that is more rigid and the model is less likely to distort, but the support material is more difficult to remove.

Shell: By selecting this mode, the software will not create the internal honeycomb fill and will only create an external shell. For example printing the bunny with this selected will print a hollow bunny, saving material however making it fragile. The shell option does not work well for parts with flat surface tops, e.g. a cube as there is nothing to support the top surface.

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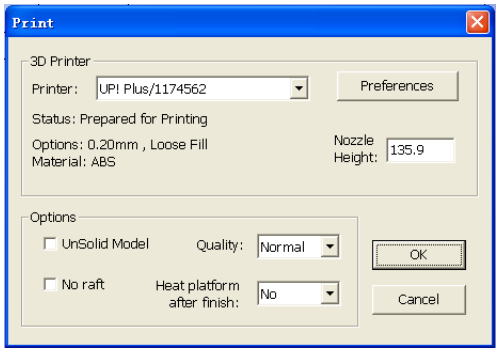
4. Printing

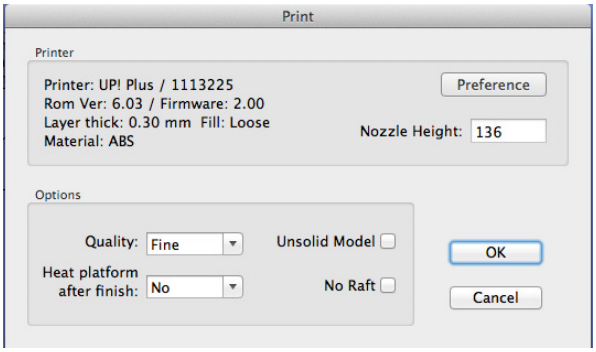
One of the keys to successful printing on the UP is platform preheating. Particularly with large parts, there is a tendency for the edges of the part to lift up from the platform.
Recommendations for printing large parts:

- Preheat the platform for 30mins – In "Maintenance" click "Table preheat 1 hour"
- Keep printer extruder door closed during preheating and printing.
- Ensure the distance between the nozzle and platform is close enough.
- Check nozzle distance to each corner of the platform.
- It also helps to run the printer in a room that is not too cold (i.e. warmer than, say, 18°C

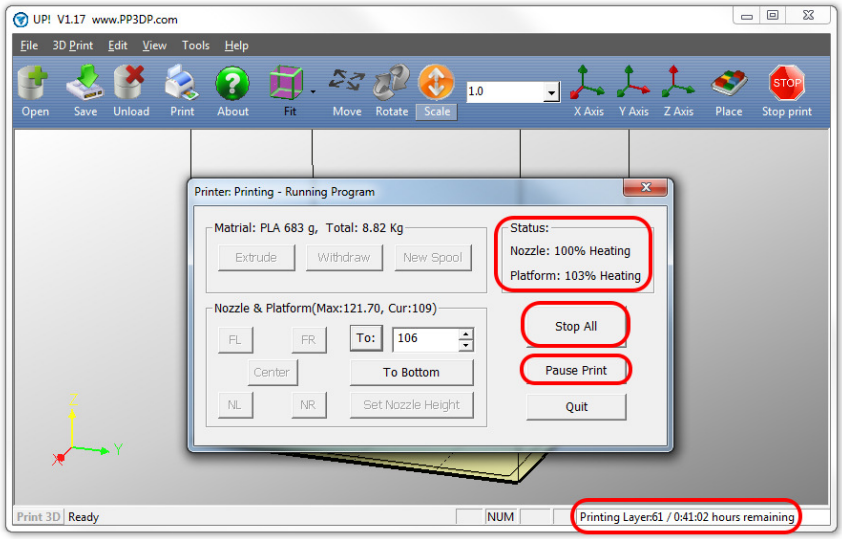
and free of drafts.)

Please ensure the following points are taken care of before printing:
Connect the 3D printer, initialise it, and set up the printing system. Load the model and place it properly on the virtual platform of the software window. Check if there is enough material for the model (the software will, generally, tell you if there is not enough material when you begin the print). If not, change the reel to a new one.
For large models results can be improved by preheating the build platform. Click the "Preheat" option on the "3D Print" menu and the printer begins to heat the platform. Let the platform get up to 105°C before beginning to print.
Click menu "3D Print->Print", and the print dialog box pops up. Choose "Preferences" to set the printing parameters. Click "OK" to begin to print.





(Windows version) *(Mac version)*


UP! V1.17 www.PP3DP.com
File 3D Print Edit View Tools Help
Open Save Unload Print About Fit Move Rotate Scale
1.0
X Axis Y Axis Z Axis Place Stop print
Printer: Printing - Running Program
Matrial: PLA 683 g, Total: 8.82 Kg
Extrude Withdraw New Spool
Status:
Nozzle: 100% Heating
Platform: 103% Heating
Nozzle & Platform(Max:121.70, Cur:109)
FL FR To: 106
Center To Bottom
NL NR Set Nozzle Height
Stop All
Pause Print
Quit
Print 3D Ready
NUM
Printing Layer:61 / 0:41:02 hours remaining

Options During Printing:

- **Stop All:** By pressing "Stop All" or the "Stop Print" icon will terminate the current print. You can reprint the last job by clicking "Tools" and "Print Again". By stopping the print, the software looses track of material used.
- **Pause Print:** Clicking "Pause Print" will pause the print job, and bring the platform down.

This is a handy feature to change colours of filament, insert objects into your print. When paused you can “Withdraw” and “Extrude” filament. **Warning:** By pausing keeps the extruder and platform heater working, it is not suggested to pause for long periods of time.

- **Status bar:** The bottom status bar shows the current layer that is currently being printed and the remaining time to complete the job.
- **Intilise Switch:** By holding down the front switch on the printer, will abort the current print job, bring the platform down and then put the printer into sleep mode.

Print Options:

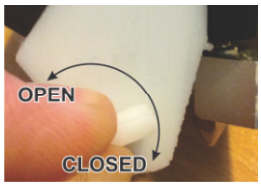
Speed: Fine, Normal or Fast. This simply determines the speed at which the printer moves. As a general rule, the slower you print, the better the quality of the parts. For tall parts, running at Fast speed can be problematic as the printer can vibrate to the extent that print quality is affected. For large surface area parts, the Fine setting can be problematic as the printer takes longer to print the part and the corners are therefore more likely to lift a little bit.

UnSolid Model: This function is useful for printing STL files that are not perfect. A perfect STL file is a fully enclosed surface (water tight), with no holes in the surface skin, and no overlapping surfaces. If your file is not perfect, this option should allow you to print it anyway.

TIP: Once the print has started, you can unplug the USB cable from the PC. The print job is stored in the printer’s internal memory, so the computer is no longer required.

4.1 Extruder Vent “wind barrier”

The lever that is located on the extruder vent “Wind barrier” does the following:

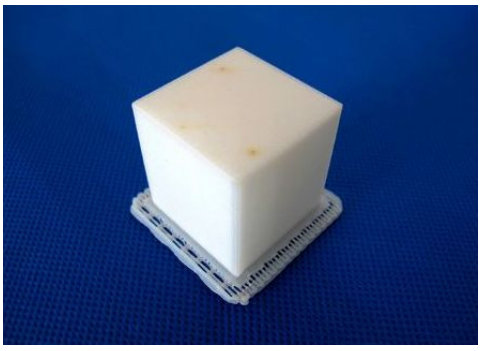


Door Closed	*Door Open*
• Each printed layer bonds to the previous layer better, making for a stronger part. • The under sides of printed curves have a rougher finish. • Recommend for large parts. • Support material is harder to remove. • The heated platform is not affected by the airflow, so reduces warping of the raft from the platform. Having the door open during pre-heating can cool the platform unevenly thus resulting in warping.	• Each printed layer bonds to the previous layer less, making for a weaker part. • The under sides of printed curves have a smoother finish • Recommend for small and intricate parts • Support material is easier to remove. • Delaminating can occur in the model, try with the door closed. • Recommend to keep the door closed during pre-heating of the platform, and open the door after the raft section has been completed to reduce chances of warping.

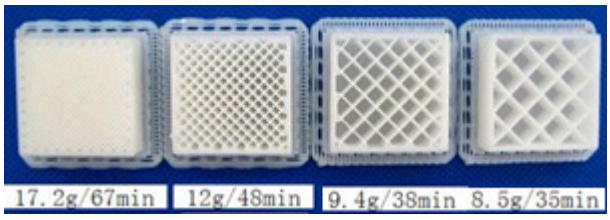
Having the door open or closed really depends on the type of model you are printing.

4.2 Calculating model costs

The main factor that will affect model cost is the honeycomb fill structure and support material. If, for example, one is printing a cube measuring 30mm x 30mm x 30mm, with a layer thickness of 0.25mm, the following quantities of material are used depending on the print mode.



Model info: 30×30×30mm layer thickness: 0.25mm



$1.32 *72cents* *56cents* *51cents*

The easiest way to calculate how much material will be used for your model is to use the “Print Preview” option under the “3D Print” menu. This will tell you the total weight of material used,

including the raft and any support material.
The price as 6/10/12 for ABS plastic from www.3DPrintingSystems.com was AU$59 per 1KG working out to be 0.06 cents per gram.

5. Model Removal

When the model has finished printing, the printer will beep, and the nozzle and platform stop heating. Open the door, remove the clips and slide the Perfboard out from the printer platform.

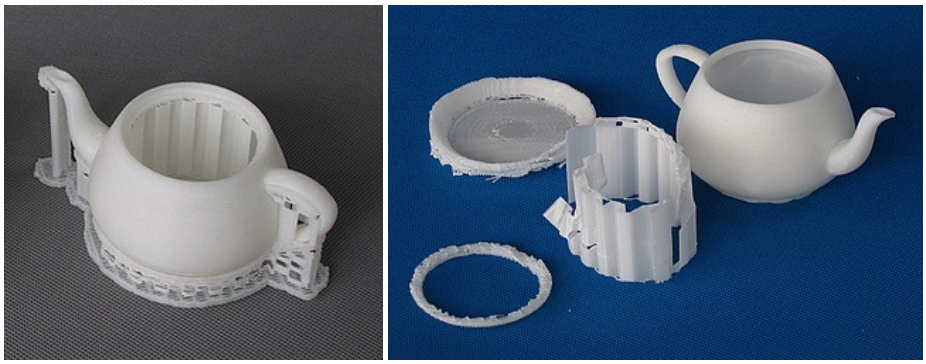
Slide the spatula under the model and slowly wiggle it back and forth to pry loose the model.
TIP: Remember to use gloves as the platform and model may still be hot. The spatula is sharp, gloves must be worn.

	CAUTION: It is strongly recommended that you wear safety glasses and gloves to remove the model from the Perfboard or the support material from the model.

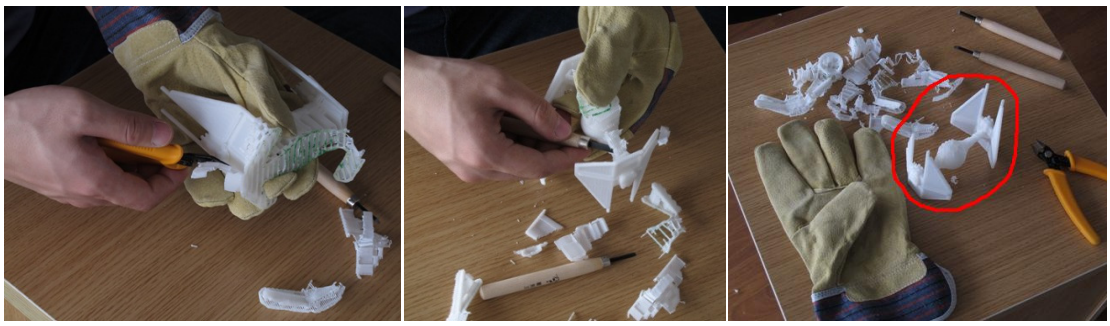
5.1 Removing the raft

The first part that the printer lays down is referred to as the Raft. In order to remove the raft from the model if the base of the model is flat is easiest using the spatula by sliding it between the raft and the model and then sliding left and right in between the model. Pulling the raft off by hand will normally cause ABS fatigue marks (were the ABS plastic goes white from stress). You can easily get the original colour of the ABS back with a slight brushing of Acetone (nail varnish remover).

5.2 Removing Support Material



Printed models are composed of two parts. One part is the model itself, and the other part is the support material used to support any overhanging parts of the model.
The support material is the same physical material as the model material, but the support material is printed at a lower density. It is very easy to distinguish the model from the support material so it is easy to remove.
Have a look at the teapot in the above pictures. The left picture shows the teapot with its support material still attached and the right picture shows the teapot with support material removed.
The support material gets removed using a combination of tools. Some material can easily be cracked off by hand. Support material close to the model is easier to remove using tools such as the knife and cutters.



It takes some practice to get comfortable with removing support material, but it can become quite an enjoyable and therapeutic task!
Pulling the support off by hand will normally cause ABS fatigue marks (were the ABS plastic goes white from stress). You can easily get the original colour of the ABS back with a slight brushing of

Acetone (nail varnish remover).

CAUTION: ALWAYS WEAR SAFETY GLASSES WHEN REMOVING SUPPORT MATERIAL, ESPECIALLY WITH PLA MATERIAL.

		CAUTION: The support material and the tools are sharp. Wear gloves and safety glasses when removing the part from the printer or support material.

6. Maintenance

6.1 Changing the Material

To change colours or different materials it's best to first withdraw the leftover material from the extruder head. Initialise the printer and choose "3D print->Maintain" and click "Withdraw" and the system automatically begins to heat the nozzle. When the nozzle reaches the correct temperature, the printer will beep, and you can gently withdraw the material.

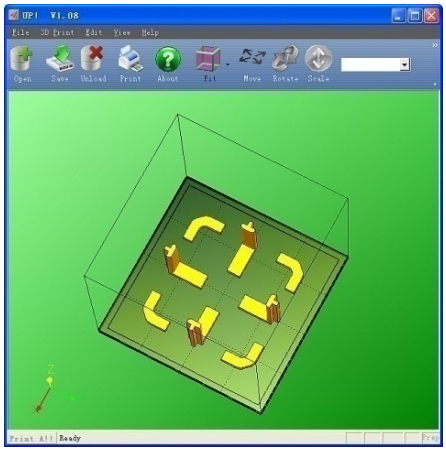
Place a new spool of material on the spool holder, and pull it through the filament tube, until the material is about 10cm out of the tube, then insert it into the hole at the top of the extruder head.

Select the "maintain" menu form the "3D Print" menu. Then press the "Extrude" button in the "maintain" dialogue. After the printer nozzle has warmed up to 260°C, the printer will beep. Push the filament into the hole at the top of the extruder head, with a little pressure, and the extruder will automatically extrude material. The plastic thread is squeezed out of the nozzle should be thin, bright and smooth. Then in the maintenance window click "New Spool" and enter the material weight of the spool so the printer can keep track of material usage.

	If the nozzle is blocked, remove the nozzle and clean it.
	The extruder and platform are hot. Use gloves when working in this area of printer.

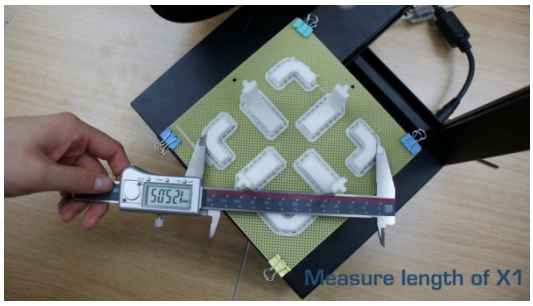
6.2 Vertical Calibration

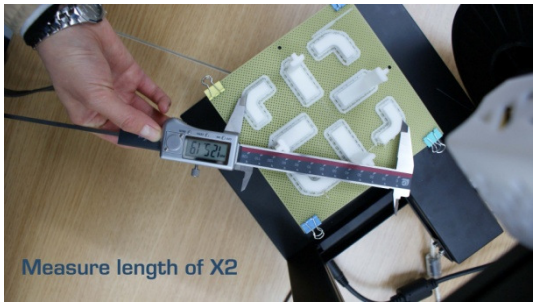
This is only recommended to carry out if you find that your models are not vertical.
The Vertical calibration procedure allows you to ensure that the printer platform is perfectly horizontal and that the printer prints consistently in the X, Y and Z direction.



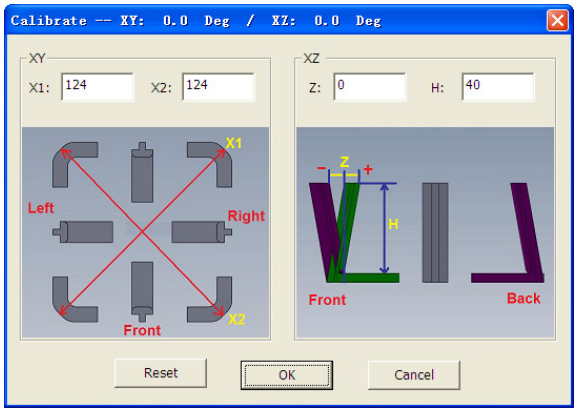
Open the "Calibrate" box form the "3D Print" menu.
Click Reset and then print the supplied Calibration model on your printer. The calibration file is located in "C:\Program Files\UP\Example".

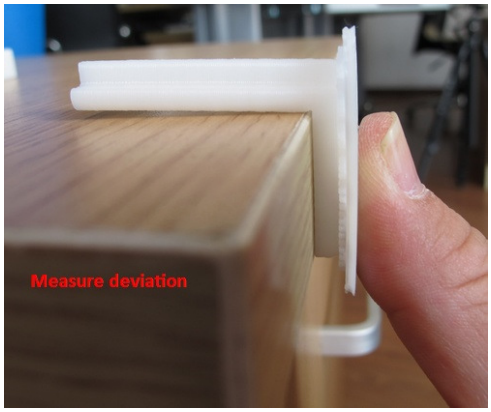
After the calibration model is printed, measure the X1 and X2 length, as shown in the pictures below.





Open the “Calibrate” box form the “3D Print” menu.
Then enter the measured X1 and X2 values into the appropriate boxes.





IMPORTANT NOTE: Before you enter any new calibration values, always click the “Reset” button, otherwise the new values get added to the old ones. Before you enter any new values, the bar at the very top of the screen should read: XY: 0.00 deg / XZ: 0.00 deg.

Next, take down the Front Centre ‘L’ shaped component, and measure its deviation. Put the exact value into the Z box. If it deviates to the right side, the value to be put into the Z box will be a positive value. If the deviates to the left, the value to put into the Z box will be a negative value.

Finally, measure the height of Front Center component, which should be 40mm if it is not scaled. Enter the exact measured value into the “H” box of the “Calibrate dialogue box.

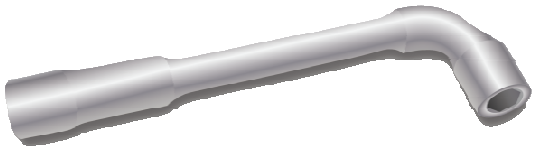
Click “OK” to record all these values and exit the calibration window.

6.3 Cleaning the outside of the nozzle

After a lot of printing, the nozzle may be covered with a layer of oxidized black ABS on the outside of the nozzle. When the printer is printing, this oxidized ABS may melt on the nozzle, and may create discolored spots in the model. To avoid this you need to regularly clean the nozzle.

Firstly, move the platform to the bottom, then do a “Withdraw” in order to heat the nozzle to melt the oxidized ABS.
Lastly, use some heat-resistant material, like 100 percent cotton cloth or soft paper. A pair of tweezers will also be required. Then clip paper or some other heat-resistant things with tweezers to clean up the nozzle.

6.4 Removing / Changing the nozzle



Should the nozzle become blocked, you may need to remove it in order to unblock, or change it. To remove the nozzle, first click Withdraw in the maintenance screen, then once the printer is at 260c, use the nozzle wrench provided in the toolkit that comes with your UP Printer.
ONLY remove the nozzle when it is hot, trying to remove it while cold will damage the extruder block.

	If the nozzle is blocked, remove the nozzle and clean it.
	The extruder and platform are hot. Use gloves when working in this area of printer.

6.5 Cleaning the Perfboard

To clean the platform use the included Perfboard pokers, or alternatively use the spatula and simply just scrape off the surface plastic until smooth on both sides. If you preheat the table for longer the plastic left in the Perfboard becomes soft and the extruded plastic sticks to it, thus not requiring the holes of the Perfboard to be empty/clean.

6.6 Lubrication of bearings

The bearings on the UP 3D Printer may occasionally require a bit of lubrication to keep it operating smoothly. The recommended grease to use is lithium grease. When lubricating the bearings, first clean off as much old grease as possible from the bearings, and then apply new grease to the bearing and slide the platform in the appropriate direction to spread the grease.

6.7 Spare parts

Almost all the plastic parts on the printer are printed by the UP printer itself. If you need to print

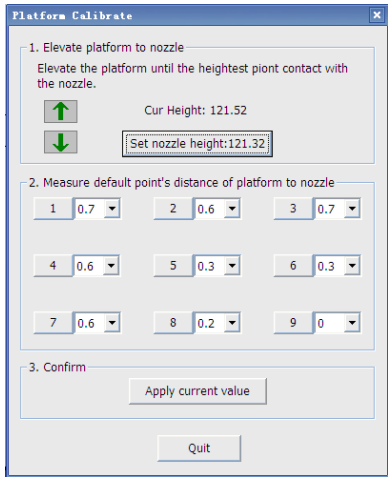
spare parts for your printer, the files for all spare parts can be found in the C:\Program Files (x86)\UP\Example\ Spare Parts folder.

6.8 Leveling the platform

There are two methods to level the platform, choose a method that works best for you.

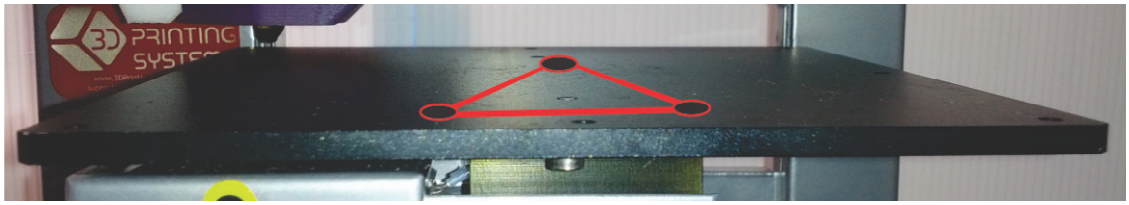
6.8.a Software Platform Leveling Calibration

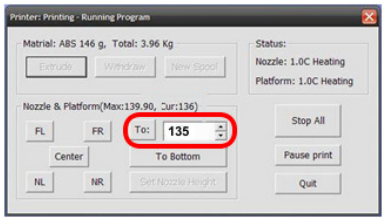
Below is a video showing how to use the software for the UP Mini which uses the same software.
http://www.youtube.com/watch?v=1Z5KVv8o3fI

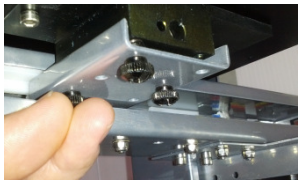
Ensure your Perfboard is clean and smooth both sides, as a small piece of plastic could cause the leveling to be uneven.	
Intilise the printer.	
Click “3D Print” \ “ Platform Calibrate”	
Click and long press the green up arrow to lift the platform to a high height like 135mm.	
Move the nozzle / platform to each of the 9 locations on the platform by clicking the corresponding location number (1, 2...9). Find out which one of the 9 locations that has the smallest gap between the nozzle and platform. That location is the highest point on the platform. Move the nozzle to the highest point on the platform and make sure the gap between the nozzle and the highest point is zero.	
Click button “Set nozzle height”	
Move the nozzle and platform to each of the other 8 locations and measure the gap between one by one. Beside each of the 9 locations is a box with the numbers inside, select one of the 10 numbers (0.1, 0.2...1) can lift the platform to a corresponding height. Use that number when it makes the gap between the nozzle and platform is zero.	**Note**: The allowed largest calibration distance between nozzle and platform is 1mm. Make sure all nine points are within this limitation. Make sure the gap between nozzle and the highest point on the platform is zero.
After all of the 9 location are measured and set, click the “Apply current vslue” at the bottom to apply the final nozzle height. A dialogue will pop up when the calibration is successful.	
Close the platform calibration dialogue and do a test print with this file http://3dprintingsystems.com/boarder-print.UP3	

6.8.b

The platform rests of three screws just like a tripod. In can be quite misleading looking at a square surface while having to level a triangle (tripod) shape. It is easier if you imagine you are leveling a triangular shape.



1. Remove clips and Perfboard from the platform.	It is harder to level the platform with the Perfboard attached.
2. Click “3D Print” / “Maintenance”	
3. Enter 135 in the To: box and click “To:”	
4. Click “Center” and then move the platform closer to the nozzle by increasing the “To:” value.	
5. Once the nozzle is just about 0.2mm away from the platform, then click “NR” = Near Right.	*The nozzle will move to the Near Right hand side.*
6. Look at the distance between the nozzle and make a rough mental note, then click “FR” = Far Right	*The nozzle will move to the Far Right hand side.*
7. Look at the distance between the nozzle and make a rough mental note, then click “FL” = Far Left	*The nozzle will move to the Far left hand side.*
8. Look at the distance between the nozzle and make a rough mental note, then click “NL” = Near Left	*The nozzle will move to the Near left hand side.*

9. The platform rests on a tripod (three sprung screws) and in order to level it, you tighten or loosen each of the three screws until the distance between the nozzle and the platform is equal at each corner.	
10. As the platform gets more level, increase the table height to the nozzle, so it is easier see the gap.	
You will most likely need to repeat the process 5-9 a few times going in a clockwise manner. Each time reducing the amount of turn on the screws.	

Loosen a screw and the related corner of platform will rise. Tighten, or loosen, the screws until you have the same gap between the nozzle and the platform at all four corners of platform.

7.0. Tips & Tricks

Large parts can sometimes have their corners lift from the platform, which causes the part to distort. This is caused by uneven heat across the surface of the platform. Preheating the platform before beginning large parts is essential to minimise this lifting.

- **Make sure the table is level!** - Remove the Perfboard and clips, bring the table up to near the nozzle and in maintenance, move the head to each corner to ensure the distance between nozzle and table is the same at each corner.
- **Make sure the table is nice and toasty!** (do a previous print or two and keep the table heated after printing) – Keep all the doors closed during printing.
- **Keep the printer away from any breezes**, this cools the model too.
- **Print hollow** - The less mass of plastic the less heat in the centre, the less warping.
- **Print the object with the least surface area on the platform,** creates more support.
- **Print closer to the Perfboard** – Move the nozzle closer to the platform.
- **Keep the Perfboard smooth** - Clean the perfboard, by scrapping off the surface and ensuring it's kept clean and smooth on both sides. (no need to remove the plastic inside the holes)
- **Large parts** - For large parts, ensure the platform is super toasty.
- **Regularly check your platform height!** It can change for a number of reasons, some of which you may not even be aware of. To check your nozzle height, refer to section 3.3.2

8. Troubleshooting

Problem or error message	Solution
No power	Verify power cord is securely plugged in.
Extruder or platform fails to reach operating temperature	1. Verify printer has initialised. if not, initialise the printer
	2. Heater is damaged, replace the heater
Material not extruding	Material is stuck in the extruder. See 3.3.3 Maintain (Extrude)
	The gap is too wide between the bearing and wire feed rollers.
Cannot communicate with printer	1. Make sure the USB cable is connected to the printer, and to the PC 2. Unplug the USB cable, then plug in again. 3. Reset the printer—power off then power on. 4. Restart the PC 5. Make sure in Device Manager in Windows that the printer driver is correctly installed. 6. Try with a different USB cable and with a different PC. 7. If using a USB Hub, try without it.
Nozzle too cool	1. Close the vent door on the extruder head 2. Check in maintenance of the extruder temperature and contact support.
Platform too cool	1. Check in maintenance of the platform temperature and contact support.
Extruder head has a clicking sound	1. This means that the drive gear is slipping on the filament. Check the nozzle and column are clean.
Others	Contact Technical Support : Support@3DPrintingSystems.com

	If the nozzle is blocked, remove the nozzle and clean it.
	The extruder and platform are hot. Use gloves when working in this area of printer.

8.1 Air Printing

If the printer is just printing in thin air and nothing is coming out, or has only completed half a model. Then you most likely have one of the following problems.

- The roll of filament has a knot in it. Check by unspooling about 10 meters always keeping tension on the spool.
- The filament feed guide on the back of the printer needs to be at about 10 degree angle. Ensure the extruder can pull the filament without any stress.
- Platform not level, then nozzle gets blocked by platform being too close to the nozzle.
- Nozzle too close to the platform
- Warping, therefore the nozzle gets blocked by the warped part being too close to the nozzle.
- Drive gear has plastic residue around the drive gear causing feed slippages.
- Dust on the filament caused by static, (ABS attracts dust) this leaves a dirty residue in the nozzle (use a small piece of foam to wipe the plastic before it goes into the head if your environment is very dusty or has a lot of static.
- A residue of ABS in the silver column and/or in the nozzle

8.2 Signs of a blocked nozzle

- When printing the fine raft cross hatching and if the lines are uneven, not a constant diameter that's a sign of a blocked nozzle / column.
- When extruding plastic, if the filament comes out at an angle, that's a sign of a blocked nozzle / column.
- The photo on the right shows a good extrusion where the filament is coming out in a thick straight line.

	If the nozzle is blocked, remove the nozzle and clean it.
	The extruder and platform are hot. Use gloves when working in this area of printer.

8.3 How to clean the nozzle

Never attempt to remove the nozzle when the extruder block is cold

- First intilise the printer, then click “Withdraw” in the maintenance screen.
- Once the printer beeps, using the gloves and nozzle spanner, unscrew the nozzle. You might need to gently push the nozzle down while unscrewing the nozzle to remove it, as the remaining plastic will act like a soft glue holding it in place, hence the reason to “withdraw” to heat up the residue plastic in the nozzle.
- Soak the nozzle for 24hrs in acetone.
- Then using the needle nose tweezers remove any left over plastic. Use a torch or light to shine into the nozzle to see if it is clean.
- If you still have residue plastic then soak in acetone again for a further 24hrs.
- It’s recommended to have a spare nozzle or even better a spare extruder block at hand.

	If the nozzle is blocked, remove the nozzle and clean it.
	The extruder and platform are hot. Use gloves when working in this area of printer.

8.4 How to clean the extruder column

- First “Withdraw” the filament from the extruder. Once the printer beeps remove the filament from the extruder head.
- Remove the nozzle.
- Click “Withdraw” again, when the printer beeps.
- Using the gloves and a 1–1.5mm drill bit and using your hand twist and poke up into the silver column of the extruder column removing any plastic residue.
- Clean the plastic off the drill bit each time.
- You might need to click “Withdraw” a few times to remove as much plastic residue as possible.

8.5 How to clean the extruder drive gear (v2 extruder head)

- First “Withdraw” the filament from the extruder. Once the printer beeps remove the filament from the extruder head.
- Switch off at the back of the printer and wait for the extruder to cool down.
- Remove all the connector plugs at the top of the extruder. (figure a)

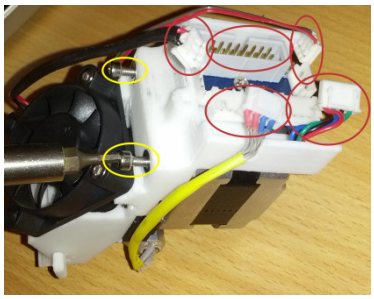


Figure a.)

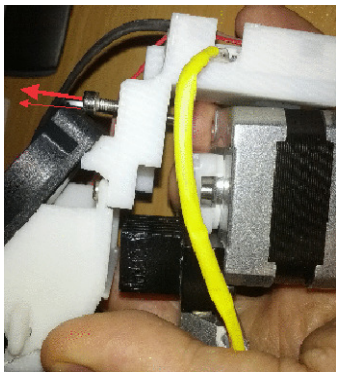


Figure b.)

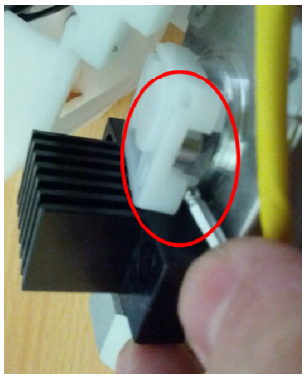


Figure b.)

- Remove the extruder head from the printer using the large supplied Alan key. Remove the two Alan screws from above the fan that hold the white plastic onto the stepper motor, as indicated with red arrows in (figure b).
- Pull the plastic part away from the stepper motor and lay to one side
- Place the Alan key under the drive gear cover (figure c) and lever the cover off. Using a brush clean the plastic dust residue that is inside the drive gear.
- Replace the drive gear cover and replace the plastic cover.

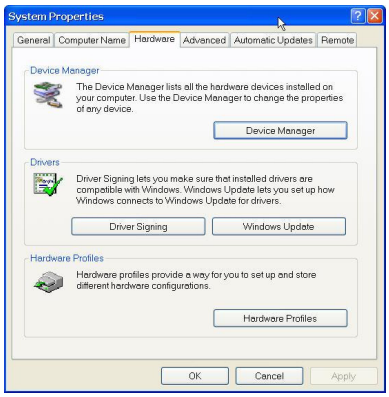
Note: There are a few different variations of extruder heads, but removal is similar.

8.6 Solution for "Winusb.dll not found" problem

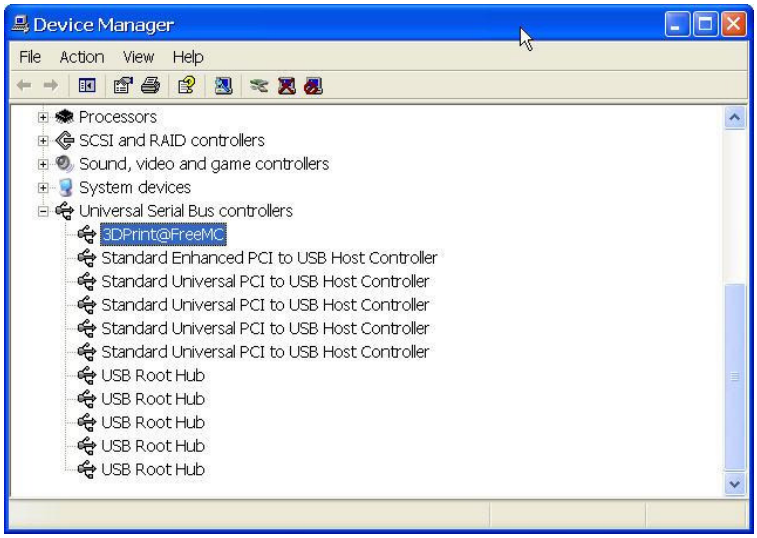
If you encounter a “Winusb.dll not found” error message, please follow the steps below:

Option 1: Uninstall Older Driver and Automatically Install New Driver

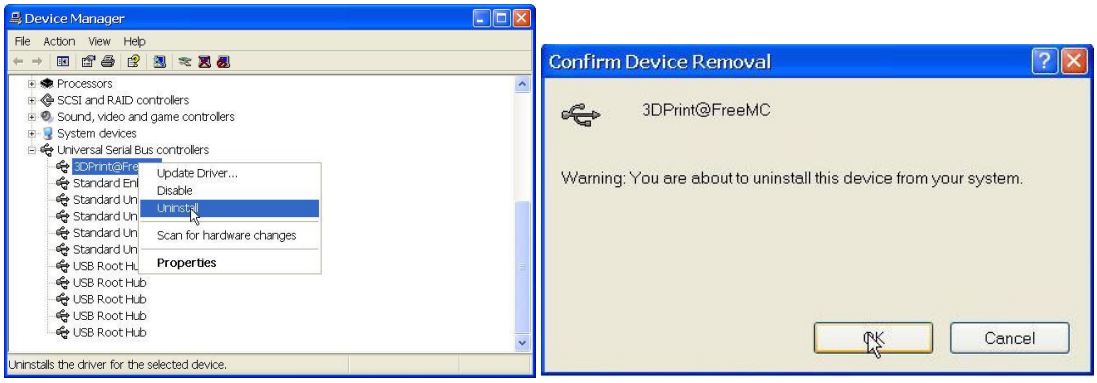
1. Open the Windows control panel, go to the “System Properties” dialog box and then select the “Hardware” page.


System Properties
General
Computer Name
Hardware
Advanced
Automatic Updates
Remote
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Device Manager
Drivers
Driver Signing lets you make sure that installed drivers are compatible with Windows. Windows Update lets you set up how Windows connects to Windows Update for drivers.
Driver Signing
Windows Update
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles
OK
Cancel
Apply

2. Click “Device Manager” button, and the following dialog box will popup. Find the “3DPrinter@FreeMC” in the USB section.



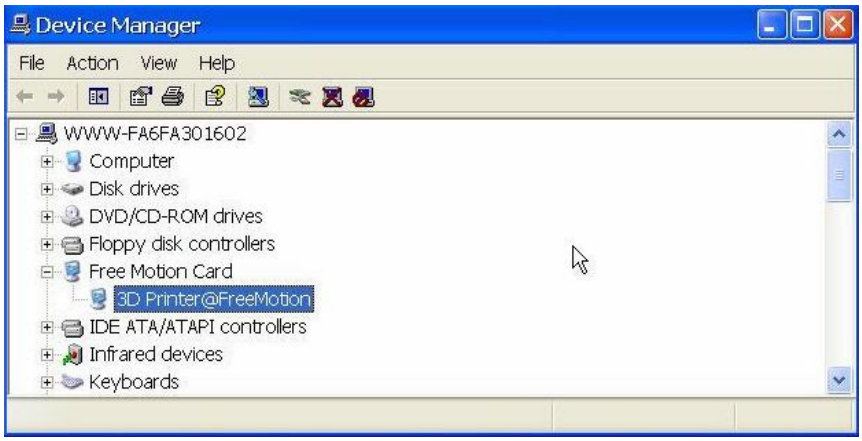
3. Click the right mouse button and select the “Uninstall” option. The confirm dialog box will appear. Click “OK”.



4. Install the latest UP software.

5. Unplug the USB cable, then plug again. Windows will find a new device. Manually select driver folder (Default is C:\Program files\UP\Driver or C:\Program files(X86)\UP\Driver);

6. There should now be a new driver section in the device manager as shown below:

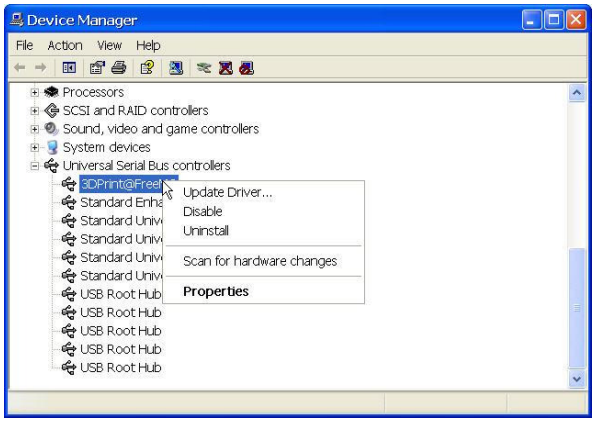


8.7 Update the driver manually.

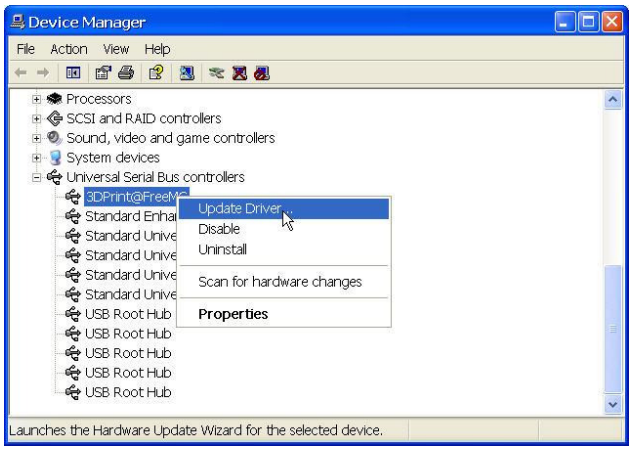
Here is a video on the driver installation http://www.youtube.com/watch?v=hGYTCRYkJr4

1. Install the latest UP software.

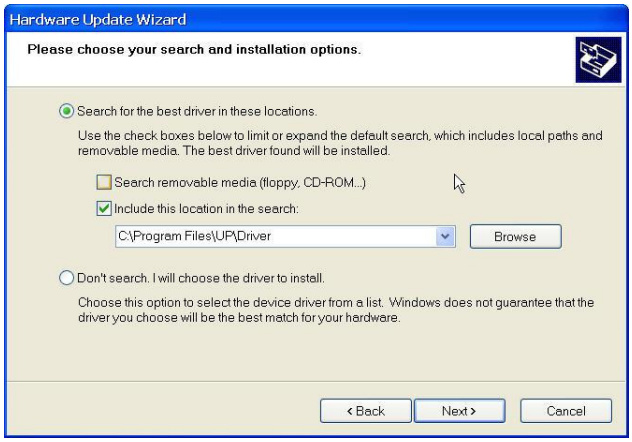
2. Find the “3DPrint@FreeMC” it might also be referred as “Free Motion” or “Unknown” in the “Device Manager” dialog box (it should be located in the USB section).



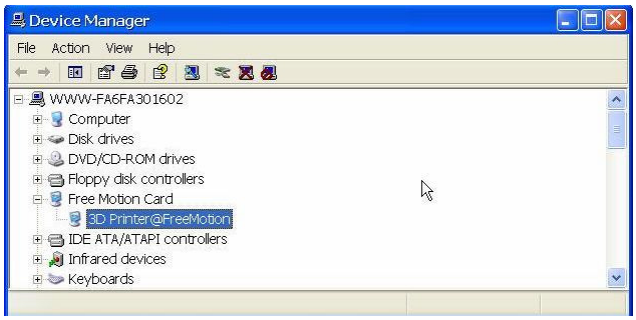
3. Select “Update Driver.” in the right click menu.



4. Select the up driver folder (the default is C:\program files\UP\Driver).


Hardware Update Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
C:\Program Files\UP\Driver
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

5. A “Free Motion Card” section should now have been inserted into the Device Manager.



Appendix A - Support

To get support for your product please contact 3D Printing Systems

Australia
Phone: +61 (0)3 9099 0225
support@3DPrintingSystems.com

New Zealand
Phone: +64 (0)9 281 4206
support@3DPrintingSystems.com